



Einstein Toolkit EU School and Workshop

June 13-17 2016
University of Trento (Italy)
Room A210 ("Polo Ferrari")¹

School Program

	Monday June 13	Tuesday June 14	Wednesday June 15
08:30-09:00	Registration		
09:00-10:20	Hawke	Hinder/Korobkin	Kastaun
10:20-10:40	Coffee Break		
10:40-12:00	Hawke	Hinder/Korobkin	Kastaun
12:00-14:00	Lunch		
14:00-15:40	Font	Hinder/Korobkin	Moesta
15:40-16:00	Coffee Break		
16:00-18:00	Font/Zanotti	Hinder/Korobkin	Miller
			17:30-19:00 Reception

List of lecturers and affiliations:

1. Toni **Font** (University of Valencia, Spain) – Numerical Methods for Relativistic HD/MHD
2. Ian **Hawke** (University of Southampton, UK) – Introduction to Numerical Methods
3. Ian **Hinder** (Albert Einstein Institute, Germany) – Einstein Toolkit
4. Jonah **Miller** (Perimeter Institute, Canada) – Scientific Visualization
5. Philipp **Moesta** (University of California Berkeley, USA) – Scientific Visualization
6. Wolfgang **Kastaun** (University of Trento, Italy) - Postprocessing
7. Oleg **Korobkin** (Los Alamos National Laboratory, USA) – Einstein Toolkit
8. Olindo **Zanotti** (University of Trento, Italy) - Numerical Methods for Relativistic HD/MHD

¹ Povo 1 on this map: <http://www.physics.unitn.it/en/15/how-to-reach-us>

Details of the School Program (Mon – Wed)

The school aim is to introduce students and postdocs to the Einstein Toolkit and in particular to its general relativistic magnetohydrodynamic (GRMHD) code GRHydro. We have invited 8 very well known lecturers from several institutions around the world. The school is organized in 3 full days with the following tentative program:

1. **Monday:** the students will get an overview of the theory behind GRHD/GRMHD codes, including: 3+1 formulation of Einstein equations, Valencia formulation for GRHD/GRMHD, finite volume and finite element methods.
2. **Tuesday:** the students will learn how to download and install the Einstein Toolkit. They will also learn how to run some simple simulations with GRHydro (e.g., neutron star oscillations, neutron star collapse to black hole, binary neutron star merger).
3. **Wednesday:** the students will learn how to visualize the results of their simulations using publicly available tools such as VisIt and yt. They will also learn how to use a publicly available post-processing framework to compute some useful quantities from their simulations.



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Workshop Program

	Thursday June 16	Friday June 17
08:30-09:00	Registration	
09:00-10:00	State of the Union	Future of ET
10:00-10:20	Contributed Talks (Tools)	Future of ET
10:20-10:40	Coffee Break	
10:40-12:00	Contributed Talks (Tools)	Lightning talks
12:00-14:00	Lunch	
14:00-14:40	Guarrasi (CINECA)	Collaboration
14:40-15:40	Contributed Talks (Physics)	Collaboration
15:40-16:00	Coffee Break	
16:00-17:00	Contributed Talks (Physics)	Collaboration
17:00-18:00	Discussion	

Contributed Talks (Tools, 15+5 minutes each):

1. 10:00 Brandt "Computational Stencils and the Chemora Framework"
2. 10:40 De Lillo "A new data toolkit for NS-BH multimessenger observations"
3. 11:00 Hinder TBA
4. 11:20 Kastaun "EOS framework + con2prim"
5. 11:40 Koppelman "Model-driven autotuning of accelerator code from Kranc scripts"

Contributed Talks (Physics, 15+5 minutes each):

1. 14:40 De Pietri "Binary Neutron Star Merger simulations using GRHydro"
2. 15:00 Ecker "Numerical Relativity and AdS/CFT Correspondence"
3. 15:20 Endrizzi "GRMHD Simulations of Binary Neutron Star Mergers with the APR4 EOS"
4. 16:00 Macpherson "Cosmology with the Einstein Toolkit"
5. 16:20 Moesta "MHD with the Einstein Toolkit"
6. 16:40 Siegel "'Low'-temperature and 'low'-density physics - an implementation of the Helmholtz EOS in GRHydro"